

ABSTRACT

An electron beam apparatus such as a sheet beam based testing apparatus has an electron-optical system for 5 irradiating an object under testing with a primary electron beam from an electron beam source, and projecting an image of a secondary electron beam emitted by the irradiation of the primary electron beam, and a detector for detecting the secondary electron beam image projected by the electron-optical system. Specifically, the electron beam apparatus 10 comprises beam generating means 2004 for irradiating an electron beam having a particular width, a primary electron-optical system 2001 for leading the beam to reach the surface of a substrate 2006 under testing, a secondary 15 electron-optical system 2002 for trapping secondary electrons generated from the substrate 2006 and introducing them into an image processing system 2015, a stage 2003 for transportably holding the substrate 2006 with a continuous degree of freedom equal to at least one, a testing chamber 20 for the substrate 2006, a substrate transport mechanism for transporting the substrate 2006 into and out of the testing chamber, an image processing analyzer 2015 for detecting defects on the substrate 2006, a vibration isolating mechanism for the testing chamber, a vacuum system for 25 holding the testing chamber at a vacuum, and a control system 2017 for displaying or storing positions of defects on the substrate 2006.